

**MISSOURI DEPARTMENT OF NATURAL RESOURCES
AIR AND LAND PROTECTION DIVISION
ENVIRONMENTAL SERVICES PROGRAM
Standard Operating Procedures**

SOP#: MDNR-FSS-220 EFFECTIVE DATE: July 25, 2003

SOP TITLE: Procedures for Collecting GPS (Global Positioning System) Locational Data with the Lowrance GlobalMap 100 GPS Receiver

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SUMMARY OF REVISIONS: Added sections 3.4 (Downloading Data to the Computer) and 3.6 (Deleting All Waypoints)

APPLICABILITY: This SOP is applicable to ESP field staff who use the Lowrance GlobalMap 100 GPS Receiver to generate locational data.

DISTRIBUTION: MoDNR Intranet
ESP SOP Coordinator

RECERTIFICATION RECORD:

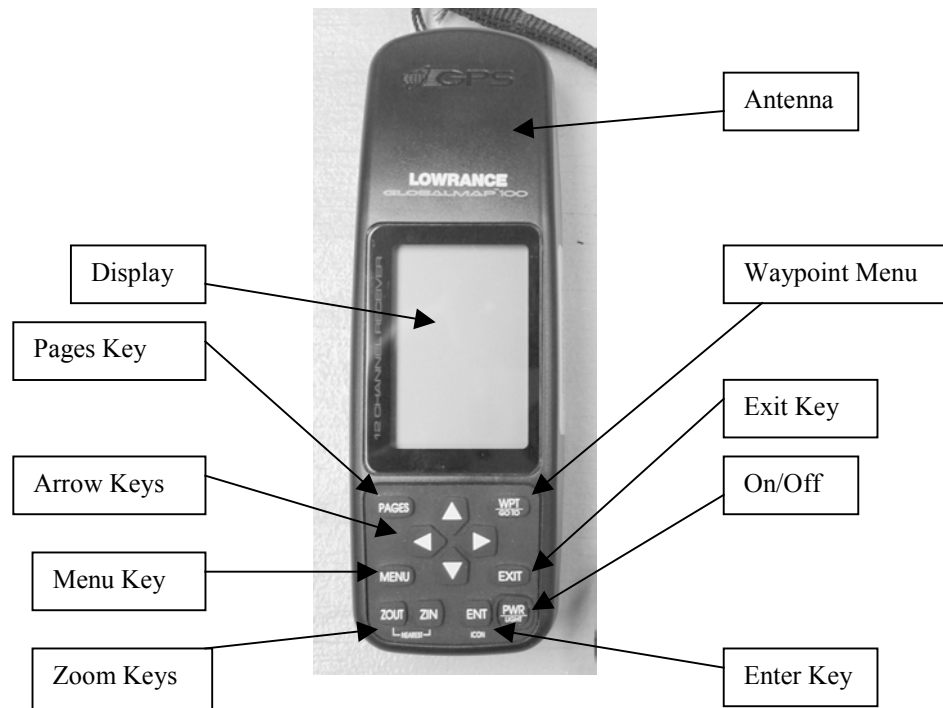
Date Reviewed				
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1.0 SCOPE AND APPLICABILITY

Locational data are and will continue to be an important part of any data collected within the department. This SOP describes procedures for collecting locational data with the Lowrance GlobalMap 100 GPS receiver. These procedures and other features of this GPS receiver can also be found in the equipment's Installation and Operation Manual.

2.0 GENERAL OPERATION AND SETUP

The following is a picture of the unit showing the keypad layout.



The following is a description of the keypad.

- **ARROW KEYS(UP/DOWN/LEFT/RIGHT)** – Allows the user to navigate through menus, maps and enter information.
- **PAGES** – Brings up the PAGES menu. Here the user can press the UP/DOWN/LEFT/RIGHT arrow keys to go to a different page. When you get to the page that you need, press the EXIT key to exit from the PAGES menu.
- **MENU** – Brings up the MENU screen. Here the user can press the UP/DOWN/LEFT/RIGHT arrow keys to navigate through the many menus. These menus are mainly used to configure the instrument. Use the UP/DOWN arrow keys to select a menu. To go into a menu press the RIGHT arrow key. To go back to the previous screen/menu press the EXIT key.
- **WPT/GO TO** – Pressing once brings up the WAYPOINT menu. Pressing twice immediately stores the current location as a waypoint.

- EXIT – Exits a menu.
- ZOUT and ZIN – Zooms out and in on a map PAGE display.
- ENT – Press when finished setting an option or entering data into the unit to save the data in the unit.
- PWR/LIGHT – Press the button for 1 second to turn unit on. While the unit unit is on, press the button once to turn the screen backlighting on/off. Press and hold the button for 3 seconds to turn the unit off.

Before taking the equipment to the field, the following steps shall be taken to ensure that the equipment is set up to properly record locational data.

2.1 Operational Check

- 2.1.1 To turn on the unit, firmly press the PWR key in the lower right corner of the keypad.
- 2.1.2 To turn the unit off, press and hold down on the PWR button for three seconds (the unit will count down on the screen, then it will shut off).

2.2 Battery Check

- 2.2.1 Turn on the unit. Wait until the screen changes to the STATUS screen. The STATUS screen has a circle on the top half and twelve horizontal satellite indicators on the bottom half.
- 2.2.2 On the lower right side of the screen is the battery indicator. A full battery is indicated by a solid black bar and empty battery by a clear bar.
- 2.2.3 If the batteries need replacing, turn off the unit. The battery compartment is on the back of the unit. The unit takes four AA batteries.

2.3 Setup

Some units have been pre-configured by ESP staff to record data in MDNR's standard format. If the unit has not been pre-configured, or if the configuration is unknown, you should go through the following steps to set or verify the configuration. It is important to ensure that the data is collected according to MDNR standards. The possible equipment configurations are listed below:

- Unit of Measurement
 - Degrees, Minutes, Seconds
 - Decimal Degrees
 - UTM Zone 15
 - UTM Zone 16

- Horizontal Datum
 - NAD27
 - NAD83
 - WGS84
 - Unknown
 - Other

The possible configurations above allow users to record data in many formats. Although readings can be converted from one format to another, this process can be confusing, difficult to learn and adds error to the resulting converted reading. To reduce errors and to allow the greatest flexibility to share data with other users the receivers should be set to display readings in Degrees, Minutes, Seconds as the primary format, UTM as the secondary format and WGS84 as the horizontal datum.

The position formats and datum referenced in this section comply with MDNR standards for recording locational data. These can be found in MDNR/DEQ's *Locational Data Method Accuracy Description*. This document can be obtained by contacting the Department GIS Coordinator or by looking on the GIS server in the file: \\n-nr1g\ngis\DnrWip\DEQ\ll_mad\LL_MAD_DataDict.doc.

- 2.3.1 Turn on the unit. Wait for the STATUS screen which shows a circle in the top half of the screen and twelve satellite status indicators in the bottom half.
- 2.3.2 When you see the STATUS screen, press the MENU button on the left middle portion of the keypad. You can use the UP and DOWN arrow keys to scroll through the menus. Scroll to the SYSTEM SETUP menu and press the RIGHT arrow key.
- 2.3.3 Scroll to the SET LOCAL TIME menu and press the RIGHT arrow key.
- 2.3.4 Set the current time to the nearest minute. Use the UP and DOWN arrow keys to change the digits of the time. Use the LEFT and RIGHT arrow keys to move to the previous or next digit in the time. Be sure to set 'A' for 'am' or 'P' for 'pm'.
- 2.3.5 When you have set the correct time press the ENT key located in the lower right corner of the keypad. This will save the current time and automatically return to the menu screen.
- 2.3.6 Press the EXIT key to return to the GPS setup menu. The EXIT key is located on the left middle portion of the keypad.
- 2.3.7 Scroll to the GPS SETUP menu and press the RIGHT arrow key.

- 2.3.8 Scroll to the POSITION FORMAT menu and press the RIGHT arrow key.
- 2.3.9 Scroll to the DMS (Degrees, Minutes, Seconds) setting and press the ENT key. You will be taken back to the menus screen.
- 2.3.10 Scroll to the ALTERNATE FORMAT menu and press the RIGHT arrow key.
- 2.3.11 Scroll to UTM (Universal Transverse Mercator) and press the ENT key. You will be taken back to the menus screen.
- 2.3.12 Scroll to the SELECT DATUM menu and press the RIGHT arrow key.
- 2.3.13 Scroll to WGS 84 and press the ENT key. You will be taken back to the menus screen.
- 2.3.14 Press the EXIT key to return to the GPS SETUP menu. Press the EXIT key again to exit the menu system. Turn off the unit.

3.0 RECORDING POINTS

Field personnel have the option of writing down the readings in their field notebook from the unit display or storing the points in the unit for later retrieval. The advantage to storing the points for later retrieval is if the user needs to store a large amount of points in a short period of time. The quality of the field time can be maximized and transcription errors can be minimized if the points do not have to be written down each time a new position is obtained. This decision is left to the discretion of the user.

3.1 Getting the Current Position

- 3.1.1 Turn on the GPS unit. Wait for the STATUS screen which shows a circle in the top half of the screen and twelve satellite status indicators in the bottom half. The unit will begin searching for satellites. As the unit locks on to satellite signals the satellite status indicators on the bottom half of the window will show the number of the satellite and a signal strength (as indicated by the horizontal bar next to the number). The outer circle indicates the horizon and the inner circle indicates an angle of 45 degrees up from the horizon, or half way between the horizon and vertical. The satellite number will also be indicated or displayed in the circle on the top part of the screen and it will be highlighted if the unit has acquired a signal from that satellite. This shows the location of the satellite in the sky relative to the GPS units position (north is always up). The unit needs at least three satellites to compute a position. When the unit has computed a position it will display a message that says "POSITION ACQUIRED".

(NOTE: Even though the unit only needs three satellites to compute a position the unit should be given time to search for as many satellites as possible. This should take no more than 1–2 minutes but may take longer depending on satellite visibility. However, if the position is being recorded in a deep valley with good tree canopy, this may take a longer time. While the unit is in operation it is constantly searching for satellites, adding new satellites and removing satellites that it can no longer track.)

- 3.1.2 To see the current position press the PAGES key located on the upper left side of the keypad. Scroll to the GROUP menu. When you get to the GROUP option, scroll left or right to get to the GROUP F option, then press the EXIT button. You should now see the current position in both DMS and UTM. If you do not wish to store the reading in the unit you must write it down from this screen at this time.

(NOTE: If the position is blinking the unit was not given sufficient time to acquire a position. To go back to the satellite status screen press PAGES, scroll up to STATUS and press the EXIT key.)

3.2 Storing Points in the Unit

- 3.2.1 Move to a site location to record locational data. If the unit has not already acquired a position, follow steps 3.1.1 and 3.1.2 above.
- 3.2.2 Press the WPT key located in the upper right portion of the keypad. The window will automatically change to the waypoint screen. The unit is now ready to store the coordinates.
- 3.2.3 The two main ways that the unit will calculate a position are an instantaneous reading and an averaged reading. The instantaneous reading calculates the position using one instantaneous reading. This means if there is any error in the reading due mainly to bad satellite visibility there is no way to factor out that error. If there is good satellite visibility (i.e. no tree canopy, high elevation) an instantaneous reading may be used.

However, bad satellite visibility may cause the location reading to jump around and an instantaneous reading may not be representative of the site location. The averaged reading calculates the position by averaging several readings into one reading, thereby reducing the effect of bad satellite visibility. Where there is poor satellite visibility (i.e. good tree canopy, deep valley) an averaged reading should be used.

To store an instantaneous or averaged reading, scroll to CREATE WPT and press the RIGHT arrow key. Here you will need to make a decision whether to choose CURRENT POS for an instantaneous reading or AVERAGE POS for an averaged reading.

3.2.4 Instantaneous Reading

3.2.4.1 Scroll to CURRENT POS and press the RIGHT arrow key.

3.2.4.2 The unit will display a message that reads “WAYPOINT CREATED”. The first line on the window shows the new waypoint identification number. Field personnel should record the waypoint identification number and a site description in their field notes. This number is used to retrieve waypoint coordinate information at a later time.

3.2.5 Averaged Reading

3.2.5.1 Scroll to AVERAGE POS and press the RIGHT arrow key.

3.2.5.2 The screen will change. The bottom of the screen will display the message POINTS TAKEN and the unit will indicate how many points it has averaged so far. When the unit has collected at least 20 – 30 points press the ENT key to save the position.

3.2.5.3 The unit will display a message that reads “WAYPOINT CREATED”. The first line on the window shows the new waypoint identification number. Field personnel should record the waypoint identification number and a site description in their field notes. This number is used to retrieve waypoint coordinate information at a later time.

3.2.6 Press the EXIT key to exit the waypoint menu. The unit may be turned off if data collection is completed.

3.3 Retrieving Data

3.3.1 Press the WPT key located in the upper right portion of the keypad to go to the waypoint menu.

3.3.2 Scroll to the WPT LIST item and press the RIGHT arrow key.

3.3.3 Scroll to the waypoint that you wish to view and press the RIGHT arrow key. The bottom of the screen will display the recording date, time and location (in DMS).

3.3.4 Press the EXIT key to exit to the main screen.

3.3.5 WQMS personnel must complete a locational data sheet (Appendix A). For all other ESP personnel, a location data sheet should be completed at the discretion of the section/unit. These completed sheets are to be stored

in a location determined by the users section/unit. After all points have been retrieved from the unit the stored waypoints must be deleted from the unit (see section 3.5 below).

3.4 Downloading Data to the Computer

- 3.4.1 Connect the GPS instrument to the computer using the GPS download cable. Connect the small black end of the cable to the top left port on the back of the GPS instrument. The flat end of the connector points downward. Connect the large silver end of the cable to a free COM port on the computer.
- 3.4.2 Turn on the GPS instrument.
- 3.4.3 Start the Lowrance GPS Data Manager (GDM) program on the computer. Check the program setup to ensure that the communications port is set to the COM port that you plugged the cable into and that the position format is set to Degrees. To view the program setup choose the GPS menu and select the OPTIONS item.
- 3.4.4 Instruct the program to connect to the GPS unit by choosing the GPS menu and selecting CONNECT.
- 3.4.5 When the program has connected to the GPS instrument, instruct the program to read points from the GPS Unit. Using the GPS menu, select the READ option. In the dialog box that appears, ensure that the *Transfer Waypoints* box is checked, then press the TRANSFER button. The program will indicate that it is transferring waypoints.
- 3.4.6 When the program has finished transferring waypoints, choose the WAYPOINTS tab in the main window. You will then be able to see your data.
- 3.4.7 Instruct the program to export the data by choosing the FILE menu and selecting the EXPORT item.
- 3.4.8 At the top of the window, press the BROWSE button. Choose a filename and location to save the file, then press OK.
- 3.4.9 Press the SAVE button. The results will be saved to a file.
- 3.4.10 You may now exit the program. When prompted if you want to save the file, choose NO, because you have already exported the data. If you choose YES, you will be prompted for a filename and location and the file will be saved in the programs native format which cannot be read by any other program.

- 3.4.11 The exported data may be imported into Excel. Once it has been verified that the data was downloaded correctly, the GPS waypoints should be deleted from the GPS unit (see section 3.6 below).

3.5 Deleting Points

- 3.5.1 Press the WPT key located in the upper right portion of the keypad to go to the waypoint menu.
- 3.5.2 Scroll to the WPT LIST item and press the RIGHT arrow key.
- 3.5.3 Scroll to the waypoint to be deleted and press the RIGHT arrow key.
- 3.5.4 Scroll to the DELETE WPT item and press the RIGHT arrow key.
- 3.5.5 Press the RIGHT arrow key to indicate YES. The data for this waypoint will now be deleted.
- 3.5.6 When finished press the EXIT key to exit the waypoint menu.

3.6 Deleting All Waypoints

- 3.6.1 Press the MENU key.
- 3.6.2 Press the DOWN or UP arrow keys until SYSTEM SETUP is highlighted in the menu. Press the RIGHT arrow key.
- 3.6.3 Press the DOWN or UP arrow keys until DELETE ALL WPTS is highlighted. Press the RIGHT arrow key.
- 3.6.4 Press the RIGHT arrow key to indicate that you want to delete all of the waypoints stored in the device or press the LEFT arrow key to cancel the operation and retain all of the stored waypoints.
- 3.6.5 Press the EXIT button twice to return to the main screen.

4.0 LOCATIONAL DATA SHEET

The Locational Data Sheet (Appendix A) is used to provide a record of how a location is recorded. WQMS personnel must complete a locational data sheet for all points. The Locational Data Collection Sheet can be found on the GIS server in the following location: */DnrWip/DEQ/ll_mad/datacoll.doc*. For all other ESP personnel, a location data sheet should be completed at the discretion of the section/unit. The data sheet requires that the user fill in the following information:

- **KEY IDENTIFIER** – *(This is not being used at this time. There is no need to fill in this blank on the data sheet.)*
- **FACILITY ID, PERMIT NUMBER OR OTHER IDENTIFIER** – A number or other way of uniquely identifying the site where a location was recorded (e.g. Permit Number, Site Name). This may be left blank if there is no such identifier for a site.
- **FACILITY OR SITE** – Generally should at least contain the facility/site name and address but may contain other information as applicable.
- **DATA OWNER** – MDNR Program that produced the data.
- **UNIT OF MEASUREMENT** – Unit of measurement used to record the data. This section also includes boxes to record the location readings.
- **METHOD OF DETERMINING LOCATION** – It is important to correctly represent the method used to collect locational data. When using the Lowrance GPS receiver to collect the data the user should specify whether the position was instantaneous (this includes writing the position down without storing it in the unit) or averaged. Data sheet settings for frequently used methods can be found below (for methods not included below, please contact the Department GIS Coordinator for the correct choice):

Method	Data Sheet Choice
Instantaneous Reading	STATIC MODE (G1)
Averaging	SIGNAL AVERAGING (G5)
Post Processing w/ Trimble Receiver	DIFFERENTIAL POST PROCESSING (G3)
Unknown Source	UNKNOWN (UN)
USGS Topographic Map	TOPO MAP (I1)
ArcView and USGS DRGs	TOPO MAP (I1)
ArcView and Other Maps	OTHER INTERPOLATION (I0)
MapBlast or MapQuest using an Address	OTHER ADDRESS MATCHING (A0)

- **MAKE AND MODEL OF GPS RECEIVER** – Make and model of the GPS receiver.
- **LOCATIONAL DATA ACCURACY** – Accuracy of the GPS location. This is usually left blank unless the true accuracy of the position is known. (NOTE: The estimated position error calculated by the Lowrance GPS receiver is not a true calculation of accuracy. Do not enter this number on the data sheet.)
- **TYPE OF LOCATIONAL DATA REPRESENTED** – This is usually a point, however, there may be special needs to represent lines or polygons which require an additional data sheet. The Department GIS Coordinator should be contacted for information on how to properly document lines and polygons.

- **HORIZONTAL DATUM** – Horizontal datum setting with which the data were collected.
- **COLLECTION SITE FEATURE** – Feature which best describes the location that was recorded.
- **COLLECTION SITE DESCRIPTIVE COMMENTS** – Further information which can be written on the data sheet to help describe the feature indicated under **COLLECTION SITE FEATURE**.
- **SOURCE OF LOCATIONAL DATA** – In most cases this will be the same as the **DATA OWNER**. This would not be the same if, for instance, the location was taken from a database compiled by another agency. The **SOURCE** would then be that agency that compiled the original data.
- **SOURCE SCALE USED TO DETERMINE THE LATITUDE AND LONGITUDE (IF APPLICABLE)** – For GPS data this box is not applicable. If a map was used to interpolate the location the scale of the map should be entered here (e.g. 1:24,000 USGS Topographic Quad Map). If ArcView is used, the user should determine the scale of the source used to generate the ArcView map. This is generally found in the metadata for a shapefile or ArcInfo coverage.
- **YOUR NAME** – Name of person who generated the data.
- **YOUR PHONE** – Phone number of person who generated the data.
- **DATE COLLECTED** – Date which the data were collected.

Sections should develop their own methods of storing these datasheets and/or entering the data into a database.

5.0 OTHER USEFUL GPS RECEIVER FUNCTIONS

This GPS receiver has many other useful features and options. All are explained in the users manual. A few of those capabilities are listed below:

- Several pre-configured **PAGES** which display many different types of information such as navigational aids, maps, date/time, current position, system status, etc.
- Enter waypoints from the **MAP** pages by pointing on a location in the map and clicking a button and the ability to enter a position as a numerical location (e.g. latitude/longitude reading taken by another method such as map interpolation).
- Plotting a trail as the user navigates along a path, saving a trail and using a saved trail for navigation.
- Send data to and receive data from the unit via a computer and software supplied by Lowrance.

- Use the navigational aids (compass, distance, estimated time of travel, course deviation indicator [CDI], etc.) to navigate to a waypoint of your choice.
- Enter several waypoints as a “route” and follow that route to a specified location.

6.0 REFERENCES

GlobalMap 100, Installation and Operation Instructions, Lowrance, © 1996, 1997, 1998, Lowrance Electronics, Inc.

MDNR/DEQ, *Locational Data Method Accuracy Description*

Appendix A
Locational Data Sheet

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Locational Data Collection Sheet

Department of Natural Resources

This sheet is used to record required locational data. Attach the **Optional Locational Data Collection Sheet** if you need to record additional information.

1. Key Identifier	(Leave Blank)						
2. Facility ID, Permit Number or Other Identifier							
3. Facility or Site (Name and Physical Address)							
4. Data Owner	(1) DEQ/ADM	(2) APCP	(3) ESP	(4) HWP	(5) LRP	(6) PDWP	(7) SWCP
	(8) SWMP	(9) TAP	(10) WPCP	Other:			
5. Unit of Measurement	Degrees, Minutes, Seconds;		Decimal Degrees;		or UTM (Round to nearest Meter)		
Latitude		Longitude					
Easting	Meters	Northing	Meters	Zone	15 or 16		
6. Method of Determining Location (Indicate the method used to determine the locational data.)							
Address Matching (Geocoding)	Code		Differential Post Processing	G3			
Block/Group	A2		Precise Positioning Service	G4			
Digitization	A6		Signal Averaging	G5			
Nearest Street Intersection	A4		Real Time Differential Processing	G6			
Other Address Matching	AO		Interpolation				
Primary Street Name	A5		Aerial Photograph	I2			
Street Centerline	A3		Topographic Map	I1			
Zip Code Centroid (Center)	Z1		Satellite Imagery	I3			
Census – 1990			Other Interpolation	IO			
Block Centroid (Center)	C1		Other				
Block/Group Centroid	C2		Classic Survey	S1			
Block/Track Centroid	C3		Land Survey	P1			
Other Centroid	CO		Loran C Code	L1			
Global Positioning System			Quarter Section Description	S2			
Static Mode	G1		Unknown	UN			
Kinematic Mode (Dynamic)	G2						
7. Make & Model of GPS Receiver (if Applicable)			8. PDOP				
8. Locational Data Accuracy	+/- _____ meters or +/- _____ feet						
9. Type of Locational Data Represented	Point; Line; or Area						
10. Horizontal Datum (Indicate the horizontal datum used to locate the collection site feature.)							
(1) NAD27, (2) NAD83, (3) WGS84, (U) Unknown Other:							

Locational Data Collection Sheet

Department of Natural Resources

11. Collection Site Feature (Mark the feature where the locational data was collected. If needed, use **12. Descriptive Comments** to provide more detail. Provide enough information so someone could return to the collection site feature.)

Collection Site Feature	Code		
Bridge	BR	Northeast Corner of the Facility or Site	NE
Building	BL	Northwest Corner of the Facility or Site	NW
Center of Facility or Site	CF	Pile	PL
Described by Descriptive Comment Field	DC	Pipe (Outfall, Intake, Point of Connection, Break, etc.)	OP
Described by Site Name	DS	Rail Road	RR
Equipment Point of Use	EU	Road	RD
Intersection (Road, Pipe, Street, etc.)	IN	Southeast Corner of the Facility or Site	SE
Lagoon or Pond	LS	Southwest Corner of the Facility or Site	SW
Loading Facility or Dock	LD	Stack	AS
Main Access Point (Entrance, Gate, etc.)	MG	Tank, Standpipe, Tower	TK
Main Office	MA	Vent	AV
Missouri Land Survey Monument	MM	Well	WL
Monitoring Station	AM	Unknown	UN
		Other (use Collection Site Descriptive Comments below)	OT

12. Collection Site Descriptive Comments (If needed, further describe the feature represented by the **Collection Site Feature**. For example, an outfall at the east end of pipe 12; or started at the NW corner, went clockwise around the site, recorded 27 points and ended back at the starting point.)

13. Source of Locational Data

Description	Cod						
Citizen	CT	NERO	D5	TAP	N5	EPA Headquarters	HQ
Contractor	CR	SLRO	D6	WPCP	N6	Private Sector	PV
Dun & Bradstreet	DB	APCP	D7	DEQ/Adm	N7	Regulated Entity	RE
EPA, Region 7	R7	ESP	D8	Kansas City Local Agency	L1	Tribe	TR
JCRO	D1	HWP	D9	Springfield Local Agency	L2	Unknown	UN
SERO	D2	LRP	N1	St. Louis City Local Agency	L3	Other _____	
SWRO	D3	PDWP	N2	St. Louis County Local Agency	L4		
KCRO	D4	SWCP	N3				
		SWMP	N4				

14. Source Scale Used to Determine the Latitude and Longitude (if applicable)

Scale: 1:24,000; 1:100,000; Other _____; or Unknown

15. Your Name (Please Print)		Your Phone		Date Collected		Time	
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Instructions for Completing the Locational Data Collection Sheet

Department of Natural Resources

1. **Key Identifier** – Leave blank at this time. This will be filled in at a later date when the Key Facility Identifier numbering system has been established.
2. **Facility ID, Permit Number or Other Identifier** – This is a program assigned ID.
3. **Facility or Site (Name and Address)** – Fill in the name and physical address of the Facility or Site.
4. **Data Owner** – Circle the name of the program that owns the data. This is the program that generated the data.
5. **Unit of Measurement** – Circle the unit of measurement (Degrees, Minutes, Seconds; Decimal Degrees; or UTM) that was used to collect the locational data and enter the latitude and longitude for locational data that was taken as Degrees, Minutes, Seconds or Decimal Degrees.

Enter the Easting and Northing for locational data that was taken in UTM and circle the zone.
6. **Method of Determining Location** – Circle the method used in determining the locational data. It will usually be GPS Static Mode, Differential Post Processing, or Signal Averaging.
7. **Make & Model of GPS Receiver** – Enter the make and model of the GPS Receiver used, if applicable.
8. **Locational Data Accuracy** – Enter the level of locational data accuracy in meters or feet.
9. **Type of Locational Data** – Circle the type of locational data. Was it taken at one spot (Point), various spots along a creek or road, etc., (Line), or taken around a lagoon or dumpsite, etc., (Area). If Line or Area are circled, see the Optional Locational Data Collection Sheet to enter additional locational data.
10. **Horizontal Datum** – Circle the horizontal datum used to collect the locational data.
11. **Collection Site Feature** – Circle the site feature where the locational data was collected (Main Office, Stack, Well, etc.) If Other is chosen or additional information is needed to describe the site, please use #12. **Collection Site Descriptive Comments** to describe the site where the data was collected.
12. **Collection Site Descriptive Comment** – Use this section to further describe features of a site where data was collected. Also, use this section if Other was selected to describe features of the site where the data was taken. Be sure to provide enough information so someone could return to the collection site.
13. **Source of Locational Data** – Circle the Source of the Locational Data. Was the locational data collected by a regional office staff member, a program staff member, or did it come from EPA, etc?

Instructions for Completing the Locational Data Collection Sheet

Department of Natural Resources

14. **Source Scale Used to Determine the Latitude and Longitude** – Enter the source scale used such as 1:24,000; 1:100,000, etc. 1:24,000 is the recommended scale.
15. **Your Name, Your Phone, and Date Collected** – Print your name, phone number, and date collected in these sections

If you have any questions, please call the program contact listed below or Jo Ann Shaw at 573-751-9370.

APCP	Debbie Boschert	573-751-0431
ESP	Tom Hoer	573-522-2498
HWP		
General Contact	Gordon Ackley	573-526-6023
Hazardous Waste Generators	Tina Ruble	573-751-3094
Tanks	Janet Roberts	573-526-6023
Superfund	Robert Stout	573-526-5958
VCP Sites	Michael Stroh	573-526-8915
LRP	Greg Anderson	573-751-6677
PDWP	Don Scott	573-526-5448
SWCP	Dean Martin	573-526-1079
SWMP	Candace Bias	573-526-3918
WPCP	Mohsen Dkhili	573-522-2552

Optional Locational Data Collection Sheet

Department of Natural Resources Division of Environmental Quality

This sheet is used to record optional locational data. If this sheet is stapled to a **Locational Data Collection Sheet**, skip numbers 1 - 4 and 9.

1. Key Identifier	(Leave Blank)						
2. Facility ID, Permit Number or Other Identifier							
3. Facility or Site (Name and Physical Address)							
4. Data Owner	(1) DEQ/ADM	(2) APCP	(3) ESP	(4) HWP	(5) LRP	(6) PDWP	(7) SWCP
	(8) SWMP	(9) TAP	(10) WPCP	Other _____			
5. Elevation			6. Elevation Accuracy				
+/- _____ Meters			+/- _____ Meters				
7. Elevation Datum Reference (If applicable, circle the appropriate code)							
(1) NAVD88 (2) NGVD29 (3) Mean Sea Level (U) Unknown (N) Not Applicable							
Other _____							
8. Method of Determining Elevation							
Method						Code	
Altimetry						A1	
GPS Carrier Phase Static Relative Positioning						G1	
GPS Carrier Phase Kinematic Relative Positioning						G2	
GPS Code Measurement (Pseudo Range) Differential						G3	
GPS Code Measurement (Pseudo Range) Precise Positioning Service						G4	
GPS Code Measurement (Pseudo Range) Standard Positioning Service - Selective Availability Off						G5	
GPS Code Measurement (Pseudo Range) Standard Positioning Service - Selective Availability On						G6	
Land Survey						S1	
Leveling Between Non Bench Mark Control Points						L2	
Leveling from a Bench Mark Control Point						L1	
Photogrammetric						P1	
Topographic Map Interpolation						T1	
Trigonometric Leveling						L3	
Other _____							
9. Your Name (Please Print)		Your Phone	()	Date Collected	/ /		

5. Unit of Measurement		Degrees, Minutes, Seconds;	Decimal Degrees;	or	UTM (Round to nearest Meter)	
Latitude		Longitude		Sequence # 01 (Starting Point for Line or Area)		
Latitude		Longitude		Sequence # 02		
Latitude		Longitude		Sequence # 03		
Latitude		Longitude		Sequence # 04		
Latitude		Longitude		Sequence # 05		
Latitude		Longitude		Sequence # 06		
Latitude		Longitude		Sequence # 07		
Latitude		Longitude		Sequence # 08		
Latitude		Longitude		Sequence # 09		
Latitude		Longitude		Sequence # 10		
Latitude		Longitude		Sequence # 11		
Latitude		Longitude		Sequence # 12		
Latitude		Longitude		Sequence # 13		
Latitude		Longitude		Sequence # 14		
Latitude		Longitude		Sequence # 15		
Easting	Meters	Northing	Meters	Zone	15 or 16	Sequence # 01 (Starting Point for Line or Area)
Easting	Meters	Northing	Meters	Zone	15 or 16	Sequence # 02
Easting	Meters	Northing	Meters	Zone	15 or 16	Sequence # 03
Easting	Meters	Northing	Meters	Zone	15 or 16	Sequence # 04
Easting	Meters	Northing	Meters	Zone	15 or 16	Sequence # 05
Easting	Meters	Northing	Meters	Zone	15 or 16	Sequence # 06
Easting	Meters	Northing	Meters	Zone	15 or 16	Sequence # 07
Easting	Meters	Northing	Meters	Zone	15 or 16	Sequence # 08
Easting	Meters	Northing	Meters	Zone	15 or 16	Sequence # 09
Easting	Meters	Northing	Meters	Zone	15 or 16	Sequence # 10
Easting	Meters	Northing	Meters	Zone	15 or 16	Sequence # 11
Easting	Meters	Northing	Meters	Zone	15 or 16	Sequence # 12
Easting	Meters	Northing	Meters	Zone	15 or 16	Sequence # 13
Easting	Meters	Northing	Meters	Zone	15 or 16	Sequence # 14
Easting	Meters	Northing	Meters	Zone	15 or 16	Sequence # 15

Instructions for Completing the Optional Locational Data Collection Sheet

Department of Natural Resources

Division of Environmental Quality

If the **Optional Locational Data Collection Sheet** is stapled to a **Locational Data Collection Sheet**, skip numbers 1, 2, 3, 4, and 9.

1. **Key Identifier** – Leave blank at this time. This will be filled in at a later date when the Key Facility Identifier numbering system has been established.
2. **Facility ID, Permit Number or Other Identifier** – Fill in the Facility ID, Permit Number, or Other Identifier associated with the Facility or Site. This will usually be a program assigned ID.
3. **Facility or Site (Name and Address)** – Fill in the name and physical address of the Facility or Site.
4. **Data Owner** – Circle the name of the program that owns the data.
5. **Elevation** – Fill in the elevation level in meters.
6. **Elevation Accuracy** – Fill in the elevation accuracy in meters.
7. **Elevation Datum Reference** – Circle the appropriate Elevation Datum Reference, if applicable.
8. **Method of Determining Elevation** – Circle the method used in determining the elevation.
9. **Your Name, Your Phone, and Date Collected** – Print your name, phone number, and date collected in these sections.

If you have any questions, please call the program contact listed below, Jo Ann Shaw (573-751-9370), or Carla Henderson (573-522-5034).

APCP		Debbie Boschert	573-751-0431
ESP		Tom Hoer	573-522-2498
HWP	General Contact	Robert Stout	573-526-5958
	Hazardous Waste Generators	Tina Ruble	573-751-3094
	Petroleum Storage Facilities	Bill Wilder	573-526-8137
	Superfund Sites	Robert Stout	573-526-5958
	VCP Sites	Michael Stroh	573-526-8915
LRP		Greg Anderson	573-751-1677
PDWP		Don Scott	573-526-5448
SWCP		Dean Martin	573-526-1079
SWMP		Stuart Harlan	573-526-3916
WPCP		Mohsen Dkhili	573-522-2552

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